Section 14 - West Colorado River Basin
Fisheries and Water-Related Wildlife

Section 14

West Colorado River Basin - Utah State Water Plan

Fisheries and Water-Related Wildlife

14.1 Introduction

This section of the *West Colorado River Basin Plan* describes the fisheries and other water-related wildlife in the basin, along with a number of water-related issues. The needs of sensitive, threatened, and endangered species are emphasized. At the same time, it is recognized that game species must remain abundant in order to provide important recreational opportunities valued by people of all ages.

A wide diversity of fish, wildlife, and plant species are found in the basin, interacting to contribute to a functioning ecosystem. Table 14-1 presents a list of some fish and wildlife species present. Federally listed threatened or endangered species are shown in Section 16, Table 16-1. The Colorado River cutthroat trout, a state sensitive species, is covered by a conservation agreement. Many other state sensitive species of fish, birds, mammals, amphibians, reptiles, and mollusks also are present in the basin.

Water does more than just offer wild animals a drink, it also provides habitat, including wetlands and riparian vegetation used by a variety wildlife for nesting, feeding, and hiding. These plants also provide the shade needed to keep water temperatures suitable for cold water species of fish and aquatic invertebrates. Riparian zones increase habitat diversity and are used by wildlife as travel and migration corridors. Riparian vegetation also stabilizes stream banks, filters sediment and chemicals from runoff, absorbs flood waters and slowly releases water over time, and provides recreational and aesthetic values.

The West Colorado River Basin provides a unique and varied environment, hosting a variety of fish and wildlife species. All species depend on a sufficient quantity and quality of water.

14.2 Background

Prior to the influx of modern-day settlers, the area was home to generally healthy populations of native fish and wildlife species. In more recent times, declines in some fish and wildlife species have occurred in the basin due mostly to man-caused effects.

Fly fishing on Huntington Creek

Table 14-1
Selected Fish and Wildlife Species*

BIG GAME MAMMALS	SMALL GAME MAMMALS	FURBEARING MAMMALS
Mule deer (N)	Black bear (N)	Beaver(N), Mink(N), Badger(N),
Elk (N)	Cottontail rabbit (N)	Bobcat(N), Muskrat(N), Coyote(N),
Desert bighorn sheep (N)	Cougar (N)	Weasel(N), Ringtail(N),
Rocky Mountain bighorn (N)	Lynx (N)	Red fox(N), Grey fox(N), Kit fox(N),
Pronghorn antelope (N)	Snowshoe hare (N)	Racoon(E),
Moose (N)		River otter (N)
Bison (E)		Marten (N)
NON-GAME MAMMALS	**GAME BIRDS**	**NON-GAME BIRDS**
Prairie dog (N)	Waterfowl (N)	Shorebirds (N)
Black-footed ferret (N)	Sage grouse(N)	Golden eagle (N)
	Wild turkey (N)	Bald eagle (N)
	Bandtail pigeon (N)	Osprey (N)
	Mourning dove (N)	Mexican spotted owl (N)
	Forest grouse (N)	Peregrine falcon (N)
	Chukar partridge (E)	Red-tail hawk (N)
	California quail (E) Ringnecked	Ferruginous hawk (N)
	pheasant (E)	Rough-legged hawk (N)
	Canadian goose (E)	Southwestern willow
	Mallard duck (N)	flycatcher (N)
	Pintail (N)	
	Teals (N)	
AMPHIBIANS	**GAME FISH**	**NON-GAME FISH**
Tiger salamander (N)	Cutthroat trout (N,E)	Humpback chub (N)
Great Basin spadefoot (N)	Rainbow trout (E)	Bonytail(N)
New Mexico spadefoot (N)	Brook trout (E)	Roundtail chub (N)
Great Plains toad (N)	Brown trout (E)	Utah chub (E)
Red-spotted toad (N)	Tiger trout (E)	Leatherside chub (E)
Woodhouse's toad (N)	Lake trout (E)	Colorado pikeminnow (N)
Canyon treefrog (N)	Splake (E)	Razorback sucker (N)
Boreal chorus frog (N)	Arctic grayling (E)	Flannelmouth sucker (N)
Northern leopard frog (N)	Largemouth bass (E)	Bluehead sucker (N)
Boreal toad (N)	Smallmouth bass (E)	White sucker (E)
	Striped bass (E)	Mottled sculpin (N)
REPTILES	Bluegill (E)	Speckled dace (N)
Utah mountain	Green sunfish (E)	Red shiner (E)
kingsnake (N)	Black crappie (E)	Redside shiner (E)
Utah milk snake (N)	Channel catfish (E)	Sand shiner (E)
Painted desert glossy	Walleye (E)	Fathead minnow (E)
snake (N)	Northern pike (E)	Bullhead minnow (E)
Sonora lyre snake (N)	Black bullhead (E)	Threadfin shad (E)
Glen Canyon	Yellow bullhead (E)	Common carp (E)
chuckwalla (N)	Yellow perch (E)	Triploid grass carp (E)
Plateau striped		Plains killifish (E)
whiptail (N)		Mosquitofish (E)
		Mountain sucker (N)

*N=native (indigenous) and E=exotic (introduced).

Source: Utah Division of Wildlife Resources

The Utah Division of Wildlife Resources (UDWR) classifies lakes and streams for sport fisheries use. Some waters are also classified by quality (see Section 12). The UDWR classification system for lakes is described as follows:

- *Class I Lakes.* These are large bodies of water that satisfy heavy fishing pressure. Productivity supports a high fish population in good condition of one or more species of game fish. Natural reproduction and/or stocking of small fish maintain an excellent sport fishery.
- *Class II Lakes*. These are also important because of their recreational value. Productivity is such that it supports a high fish population in good condition of one or more species of game fish. Coldwater lakes in this class require stocking of small fish to maintain good fishing. Some Class II lakes are smaller and may have lower aesthetic ratings or biological deficiencies.
- *Class III Lakes and Reservoirs.* These normally provide angling for those who reside within 50 miles. Some are in an area where there is little fishing and may be very important locally.
- *Class IV, V, and VI Lakes and Reservoirs.* These contribute little to fishing opportunities. Some provide fishing where little fishery exists, except when stocked with catchable fish.

Most streams have been classified for fish habitat to assist in management decisions. The classifications for selected streams are shown in Section 12, Table 12-4. Stream classifications are described as follows:

- *Class I Streams*. These are top quality fishing waters. These streams are generally outstanding in natural beauty and are of a unique type. Their productivity supports high fish populations of one or more species of the more desirable game fish in good condition. Natural reproduction or the stocking of small fish maintains an excellent sport fishery.
- *Class II Streams*. These are of great importance for fishing. They are productive streams with high esthetic value. Fishing and other recreational uses should be the primary consideration. They are moderate to large in size and may have some human development along them. Many Class II streams may be comparable to Class I, except for size.
- *Class III Streams*. These are the most common and support the bulk of stream fishing pressure in the West Colorado River Basin.
- *Class IV Streams*. These are typically poor in quality with limited fishery value. Fishing should be considered a secondary use. A few provide an important catchable fishery in areas where no other fishery exists.
- *Class V Streams.* These are now practically valueless for sport fishing. However, they are often important to non-game fish and other wildlife.
- *Class VI Streams*. These have stream channels which are dewatered for significant time periods during the year. Many of the stream sections could support good to excellent fish populations if appropriate minimum flows could be provided.

14.3 Sport Fish

This basin supports a diversity of sport fish species (see Table 14-1). Fishing is a popular pastime on lakes, reservoirs and streams. Game fish range from trout at high elevations to warmwater species at low elevations. Trout species include native and introduced species, whereas no warmwater game species are native. Lake Powell is the largest reservoir in the basin and by far supports the most angling pressure.

The UDWR manages sport fish primarily by stocking and fishing regulations. The type and level of fish stocking at each stream or lake is based on habitat capacity and angler use. The UDWR is currently working on management plans for the Price, San Rafael, Muddy, Dirty Devil, Fremont, Escalante, Green and Colorado river drainages.

These plans identify major aquatic resources, issues, management objectives and strategies for

recreational waters. Lakes and reservoirs containing sports fish are shown in Table 14-2. Also see Section 12, Table 12-4 for additional data.

14.4 Native Fish

Native fish species are also diverse and include cold water and warm water species (see Table 14-1). Protection of these species is important to keep functioning ecosystems intact.

Colorado River cutthroat trout are the only native fish which are also considered a sport fish species. While once abundant in small streams, distribution of this species is now extremely limited. Other native species have also been extirpated in local areas. Declines can be attributed to natural causes and some of man's activities. Recovery of native Colorado River cutthroat trout and healthy populations of other native fish hinge on improving habitat conditions, including maintenance or enhancement of water flows in streams and rivers.

14.5 Upper Colorado River Basin Endangered Fishes Recovery Program

The Colorado River system, including the Green and San Juan rivers, contains four endangered fish. These are the Colorado pikeminnow, humpback chub, bonytail chub and razorback sucker. Efforts to recover these species are overseen by the Recovery Implementation Program (RIP) for Endangered Fishes of the Upper Colorado River Basin. Recovery efforts on the San Juan River are covered under the San Juan RIP.

The Upper Colorado River Basin RIP is a 15-year, interagency partnership aimed at recovering these four endangered fishes. The program was launched in 1988, when the governors of Colorado, Utah and Wyoming, the Secretary of the Interior, and the Administrator of Western Area Power Administration signed a cooperative agreement committing each participant to implementing the program's elements. The recovery program elements include: habitat management; habitat development; research monitoring and data management; and non-native species, sport fishing, and public information and involvement.

Accomplishments which affect the West Colorado River Basin include the following:

- FWS has waived charges for new depletions less than 100 acre-feet per year.
- DWR stocked 2,000 bonytails in Colorado River during 1995-97 and 6,000 bonytails near Dewey Bridge in 1996 and 1998.
- DWR stocked about 100,000 pikeminnows in the San Juan River in 1996, 100,000 in 1997 and 10,000 in 1998.
- FWS stocked 3,400 razorback suckers in Gunnison River and 1,600 in San Juan River in 1997. They also stocked 2,000 razorback suckers in the Green and Colorado rivers in 1995 and 1996 and stocked 350 in 1998.
- Federal and state biologists completed a comprehensive report summarizing the first seven years of efforts to track endangered, native and non-native fish populations. Biologists continue to conduct annual monitoring efforts to track Colorado pikeminnow and sympatric species. In 1998, program was expanded to humpback chub and razorback sucker.
- Federal and state wildlife agencies in Colorado, Utah and Wyoming have finalized an agreement on stocking of non-native sport fish. Recovery Program participants have coordinated public involvement activities on key program actions.
- The Recovery Program has developed and distributed a wide range of informational products to the public.
- The Recovery Program has established a web site.

14.6 Lake Powell

The construction of Glen Canyon Dam and Lake Powell has provided annual storage of nearly 27 million acre-feet of water, benefitting millions of water users. It has also provided hydroelectric generation. Lake Powell is acknowledged as a prime recreational site for millions of tourists and vacationers every year.

Table 14-2
Reservoir Physical and Fish Data

Reservoir/Lake	Elevation (feet)	Surface Area (acres)	Maximum Depth (feet)	Fish Species*
Manti Mtn. Area:				
Academy Mill Reservoir	8,798	6	15	BK
Bastian Reservoir	-	-	-	BK
Benchs Pond	-	3	10	RT
Blue Lake	10,261	3	22	BK, GR
Boulger Pond	-	3	14	RT, CT
Cleveland Reservoir	8,812	185	56	RT, CT, MS
Cove Lake	-	8	8	RT, BK, GR
Duck Fork Reservoir	9,305	47	35	CT, RT
Electric Lake	8,575	425	217	CT, RT, RS
Emerald Lake	10,135	-	26	RT
Emery (Larson) River	9,439	-	22	BK
Ferron Reservoir	9,472	57	30	RT, CT
Gooseberry Reservoir	8,424	57	16	RT, CT, MS
Grassy Lake Reservoir	8,809	11	15	RT, BK, TG
Grassy Trail Reservoir	7,613	29	68	RT, BT, TG
Huntington Ponds	-	-	-	RT, UC
Huntington North	5,839	225	56	RT,BT,LB,BG,GS,CC, BS,UC
Huntington Reservoir	9,014	118	85	TG, CT
Jewkes-VanBuren Lake	-	2	-	RT, BK
Joes Valley Reservoir	6,990	1,183	169	RT, CT, SP, BS, UC
Marys Lake	-	-	-	RT, BK
Miller Flat Reservoir	8,462	160	64	RT
Millsite Reservoir	6,211	435	102	RT, CT, BS
Petes Hole	8,867	13	17	RT, CT
Potters Pond #1	8,978	8	18	RT
Potters Pond #2	8,970	8	11	RT
Scofield Reservoir	7,618	2,815	66	RT, CT, MS, RS
Snow Lake	-	5	21	RT, GR
Soup Bowl Reservoir	8,744	2	17	RT, CT
Spinners Reservoir	9,621	25	-	RT
Willow Lake	9,700	25	12	RT, BK, TG, GR
Wrigley Spring River	-	11	18	RT, BK, TG
Fremont River Drainage Area:				
Aberdunk Lake	-	3	30	BK,CT
Artery Lake	-	0.5	10	BK
Beaver Dams Reservoir	-	8	6	BK,MS
Big Lake	10,850	21	11	BK
Blind Lake	-	2	18	BT
Blind Lake	10,233	52	75	BK,CT,RT,SP
Bobs Hole Reservoir	9,500	6	20	BK
Clark Lake	-	2	16	-

Table 14-2 (Continued)
Reservoir Physical and Fish Data

Reservoir/Lake	Elevation (feet)	Surface Area (acres)	Maximum Depth (feet)	Fish Species*
Fremont River Drainage Area: (Continued)				
Clear Lake	-	2	17	BK
Coleman Reservoir	10,000	5	16	BK,RT
Cook Lake	10,000	10	12	BK,RT
Cub Lake	11,600	1	19	BK
Dead Horse Lake	11,000	3	7	BK
Deep Creek Lake	10,100	5	14	BK
Donkey Lake	10,106	27	27	BK,CT
Fish Creek Reservoir	10,300	28	20	BK,CT,RT,MS
Fish Lake	8,900	2500	117	BK,BT,CT,RT,KS, LK,SP,UC,CP,RS, FS,SC
Forsyth Reservoir	8,000	171	80	BK,RT,SC
Grass Lake	10,650	2	6	CT
Green Lake	10,300	7	18	BK
Honeymoon Lake	-	1	10	BK
Johnson Reservoir	8,381	704	21	CT,RT,UC,US
Lava Lake	-	1	16	BK
Left Hand Reservoir	-	13	9	BK
Lightning Lake	11,000	4	7	-
Long Lake	-	1	-	-
Lost Lake	10,200	6	41	BK
Lower Bowns Reservoir	7,200	90	45	CT,RT
Lower Pine Creek Pond	8,400	3	6	BK
Meeks Lake	7,800	4	26	BK,RT
Mill Meadow Reservoir	-	156	90	BT,CT,RT,UC,RS
Miller Lake	10,100	6	11	BK,RT
Moss Lake	9,000	2	14	BK
Ned's Reservoir	9,000	4	NA	BK
Escalante River Drainage Area:				
Barker Reservoir	9,900	13	11	BK,RT
Barney Griffin Pond	10,000	1	22	BK
Blue Lake	9,900	2	10	BK
Chriss Lake	10,000	5	13	BK,CT,RT
Circle Lake	10,800	7	7	BK
Crater Lake	10,950	7	20	BK,CT
Crescent Lake	10,800	9	26	CT
Deer Creek Lake	10,000	22	28	BK,CT

Table 14-2 (Continued)
Reservoir Physical and Fish Data

Reservoir	Elevation (feet)	Surface Area (acres)	Maximum Depth (feet)	Fish Species
Escalante River Drainage Area: (Continued)				
Divide Lake	9600	7	2	BK
Dougherty Basin	10000	3	13	BK
East Lake	10740	3	13	BK
Elbow Lake	1120 0	5	3	-
Flat Lake	9900	8	4	BK
Garkane Beaver Pond	-	2		BK
Garkane Reservoir, East	7700	2	13	BK, CT, RT
Garkane Reservoir, Main	7000	2	12	RT
Grass Lake	9750	12		BK, CT
Green Lake	10050	4	30	CT
Half Moon Lake	10400	15	12	BK, CT
Horseshoe Lake	10740	12	16	BK
Jacobs Valley Reservoir	10300	391	7	BK
Joy Lay Reservoir	9200	4	9	BK
Kings Pasture Pond	9400	1		RT
Ledge Lake	10600	2	7	BK, CT
Long Willow Bottoms	9500	5	17	BK, CT
Lower Barker Reservoir	9200	5	20	-
McGath Lake	9372	60	13	BK
Meeks Lake	10750	5	8	BK
Mooseman Lake	9880	4	10	BK, CT
Mooseman Pond, East	9850	3		CT
Mooseman Pond, West	9890	1		CT
Noon Lake	10900	2	8	CT
North Creek Reservoir	9400	30	47	-
Posey Lake Beaver Dam	-	1		BK, CT
Posey Lake	9700	8	17	BK, RT
Ridge Lake	11080	2	7	-
Rin Lake	10950	8	19	BK
Round Willow Bottom	9900	9	11	BK, CT
Shaort Lake	10132	2	8	BK, CT
Spectacle Reservoir	10950	21	24	BK, CT, RT
Steep Creek Reservoir	10000	7	5	BK
Tule Lake	9000	2	20	BK
Wide Hollow Reservoir	5870	145	29	RT
Yellow Lake	9900	6	5	BK
Lake Powell	3700	135000	560	LB, SB, WA, ST, CC, BG, GS, NP, BC, BB, RZ, RS, FM, TS, FS

*BB-black bullhead, BC-black crappie, BG-bluegill, BK-brook trout, BS-bluehead sucker, BT-brown trout, CC-channel catfish, CT-cutthroat trout, FS- flannelmouth sucker, GF-goldfish, GR-arctic grayling, GS-green sunfish, LB-largemouth bass, MS-mountain sucker, NP-northern pike, RS-redside shiner, RT-rainbow trout, RZ-razorback sucker, SB-smallmouth bass, SC-scolpin, SP-splake, ST-stripped bass, TG-tiger trout, TS-threadfin shad, UC-Utah chub, US-Utah sucker, WA-walleye.

Source: Utah Division of Wildlife Resources

Lake Powell backs up 186 miles of river system above Glen Canyon Dam. The clear, deep-water environment of the lake is radically different from the fast-flowing and turbid historic Colorado River. Colorado River fish cannot complete their life cycle in the reservoir because of predation by better-adapted exotic fish. Native species must rely on the remaining flowing reaches of the rivers without dams for survival.

Some limited use of Lake Powell's inflow areas by native and endangered fish occurs where the tributaries enter. These productive locations where nutrient-rich water is converted to planktonic life by sunlight in clear water provide a food-rich situation for small fish of all species. Although young native fish which have drifted downstream have been found in these inflow areas, predation by exotic fish is high. Colorado River pikeminnow have overwintered in the inflow areas and then migrated back upstream. Use of inflow areas by native fish is being investigated by the UDWR, the National Park Service and Bureau of Reclamation in an attempt to enhance their survival.

The UDWR currently manages Lake Powell as a sport fishery with inflowing tributaries managed for native fish. The lake, due to its large size and diverse assemblage of warm water sport fish species, receives much more angling pressure than any other water in the basin.

14.7 Wildlife, Wetlands and Riparian Areas

This basin supports a diversity of wildlife species, and maintaining healthy and self-sustaining populations of these species requires suitable habitat. In general, wildlife benefit from, and many species need, the same habitat which provides good conditions for fish.

Riparian areas generally offer all four major habitat components needed by wildlife: food, water, cover and living space. Where there is adequate water and deep soils, production of plant and animal biomass increases. The contrast with the surrounding desert-like vegetation in much of the basin increases the habitat diversity and produces various microclimates. Linear riparian zones serve as connectors between habitat types and provide travel lanes and migration routes for such animals as birds, bats, deer and elk. Where streams have been dewatered, wildlife habitat and watering sources are reduced.

Desert Lake Waterfowl Management Area

Because riparian areas are so important to wildlife, even streams with naturally low or intermittent flows, and streams which do not support fisheries, need to be protected for amphibians and other wildlife. Protection of riparian vegetation will produce benefits including absorption of flood waters, reduced erosion, filtering of sediment and chemicals from runoff, and esthetic and recreational values.

Other wetlands are also important to wildlife, especially to waterfowl and amphibians. Within the water budget area surveyed by the Division of Water Resources, there are about 26,000 acres of man-made wetlands/open water areas located within the irrigated cropland area. In addition, many more acres of wetlands/open water areas are outside the irrigated portions of the West Colorado River Basin. Most of the vegetation is greasewood, rabbitbrush, and saltgrass. Two wetlands in the basin managed specifically for waterfowl are Desert Lake Waterfowl Management Area (approximately 3,000 acres) near Emery, and Bicknell Bottoms (659 acres) near Bicknell.

Construction of water storage facilities has expanded distribution of some wildlife and increased recreational opportunities. At the same time, the increased demand for water and building of communities has sometimes been in direct

conflict with the needs of many wildlife species. Destruction of, or any work in, wetlands or riparian areas usually requires a federal permit. This includes activities associated with water development. The UDWR, USFWS and other agencies comment on these proposals and recommend mitigation for loss of wildlife habitat.

14.8 Organizations and Regulations

Local, state and federal agencies have a part in passing and enforcing laws to regulate management of water facilities affecting wildlife. Private organizations work with public entities to protect fish and wildlife habitat.

14.8.1 Local

Cities, irrigation companies and water districts control most of the water facilities affecting fish and wildlife. Their impact may be either direct or indirect. Early irrigation rights holders were not required to leave water in the streams during times of low flow. As a result, there are no instream flow water rights in any of the streams in the West Colorado River Basin.

Several wildlife groups are in the West Colorado River Basin. They are involved in the policy making process by providing local input to the Regional Advisory Council (RAC). This group makes recommendations about regulations to Utah's Wildlife Board.

14.8.2 State

The DWR has responsibility for the management, protection, propagation and conservation of the state's wildlife resources. The DWR recognizes that planning for wildlife habitat needs is an integral part of basin water planning. Fishing, hunting and non-game wildlife activities contribute financially to the economy.

The DWR assesses water development plans and identifies benefits and adverse impacts, recommends possible mitigation and minimization of impacts, and, if this is not possible, suggests project termination. The division also provides factual information regarding consequences of unmitigated and mitigated impacts to wildlife resources.

Title 73-3-3 of the *Utah Code Annotated* allows the division to file for minimum instream flow water rights. The division can also file requests for permanent changes in the operation of certain streams and rivers to preserve critical fish habitat and to provide permanent enhancement of the state's stream and river fisheries. Water releases from reservoirs could be used to provide instream flows. All filings must be approved by the state engineer and adhere to the state's appropriation doctrine.

14.8.3 Federal

The USFWS is charged with carrying out the Fish and Wildlife Coordination Act which requires consultation between USFWS and state agencies on specific activities. The USFWS is also charged with administering the Endangered Species Act. All federal agencies are charged to further the purposes of the act by carrying out programs for the conservation of threatened and endangered species. See Section 16.4.8 for more details.

In 1996 the Corps of Engineers received authority from Congress to study and develop projects and participate in environmental stream and river restorations. Appropriate objectives of such projects include fish and wildlife habitat, wetland and river meander restoration, restoration of riparian areas, and stabilization of riverbanks and beds.

14.9 Fish, Wildlife and Habitat Problems and Needs

Many people are attracted to the West Colorado River Basin because of the unique year-round attractions and facilities. This results in more pressure on the environment as a whole and on the water resources in particular. Conflicts will increase in the future due to finite land and water resources and an expanding human population. Some groups advocate preserving the resources from all development and use, while other groups depend on these and other resources to be developed for their livelihood.

Preserving native species is important to keep functioning ecosystems intact. Water quality

problems associated with agricultural water use, such as high salinity, accumulation of toxic substances and other pollution need to be monitored and addressed.

There is a need to preserve quality fisheries. Fish populations in wild fish waters are especially sensitive to alterations and impacts to their habitat. Many streams no longer support abundant fish populations because of high silt loads, unnatural water flows and degredation of riparian vegetation. Most perennial streams are either captured in storage reservoirs or diverted, primarily for irrigation, during the growing season.

State and federal agencies have become heavily involved in these water issues and the protection of habitat for fish and wildlife populations. However, much more effort is needed to coordinate development with water developers/managers and seek for win-win solutions to problems.

Determining wildlife habitat needs is recognized as an integral part of basin planning. Fishing, hunting and non-game wildlife activities contribute financially to the economy and need to be considered in water development plans.

The UDWR is currently working on management plans for the drainages in the basin. These plans identify major resource issues and solutions, and they outline management objectives and strategies for aquatic resources and recreational waters. The UDWR should include the Division of Water Resources and local entities in preparation of these plans.

14.10 Alternative Solutions

Early communication with the UDWR in the planning process could identify and alleviate impacts on fish, wildlife, and habitat resources and avoid the necessity for mitigation. Where mitigation becomes necessary, it can be made a part of project plans. Water-related mitigation alternatives include maintenance of native fish communities and habitat, or replacement of these values with similar facilities in a nearby location.

Habitat can be classified according to value. Four categories of habitat used in Utah are: critical, high-priority, substantial-value and limited-value. Mitigation goals vary with habitat value, wildlife species and project plans.

Several approaches to mitigation are listed below in order of importance.

- Avoiding the impact altogether by not taking a certain action.
- Minimizing impacts by limiting the magnitude of an action or its implementation.
- Rectifying the impact by repairing, rehabilitating or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environment within the same area.

Whenever reservoir storage projects are constructed, consideration should be given to providing conservation pools or purchases of storage water. This may enhance fish and wildlife values, provide holdover storage during dry periods, and enhance instream flows for sport fisheries.

One way to reduce problems of livestock overgrazing in riparian areas is to provide water upland from stream banks. Options include upland ponds, horizontal wells, and wind power or solar energy to pump water to upland areas. Fencing of riparian habitat may be needed in areas with the most severe problems in order for recovery to occur. Constructing instream and bank structures is another technique to assist with acceleration of regrowth on riparian areas. These may include small impoundments or low head dams (much like those built by beavers), rock weirs, streambank modifications, rock or log barbs and vanes, vegetative plantings, and anchoring trees or rocks to streambanks to prevent further erosion.

14.11 Policy Issues and Recommendations

Five issues are presented on fish and water-related wildlife.

14.11.1 Loss of Wetlands and Riparian Habitat

Issue - There is a need to protect wetlands and riparian habitat and reduce sedimentation of lakes, reservoirs and streams.

Discussion - The West Colorado River Basin has many acres of wetlands and riparian areas, including about 26,000 acres within and around the irrigated cropland areas. Wetlands should be protected because of their importance to wildlife and humans. Desert Lake and Bicknell Bottoms Waterfowl Management areas are the only managed waterfowl habitat. Other areas include farm ponds, reservoirs, and other water sources including springs and seeps. These are used primarily as resting areas for migrating birds, although some species live year-round in these areas. The UDWR should be contacted during project planning to provide input and suggest mitigation practices.

Riparian areas include land directly influenced by sufficient water to sustain growth. Even though riparian areas account for a minor part of the total land area in the basin, the vast majority of wildlife species are associated with them at some point in their life cycle. As such, they are important areas to wildlife. Where spring areas have been impacted by wildlife and livestock, rehabilitation should be investigated.

When riparian areas are in good condition, they provide streambank stability, maintain channel contours, reduce sedimentation, regulate water flow, and enhance water quality. A good riparian community has abundant and diverse plant life covering most of the soil and showing a diversity in age distribution and structure. Poorly located, designed and maintained gravel/dirt roads can contribute significant amounts of sediment to lakes and streams.

Recommendation - The UDWR should identify wetlands and riparian areas with significant wildlife values to aid in their protection. Best Management Practices (BMP) should be used to protect and enhance wetlands and riparian areas.

14.11.2 Lack of Instream Flows for Trout Below Scofield Reservoir

Issue - There is a need to provide year-round water flows for trout populations in Lower Fish Creek below Scofield Reservoir.

Discussion - Nearly every fall, the irrigation companies controlling the water in Scofield Reservoir completely shut off the outflow in order to store the following year's water supply. Instream flow rights were not established at the time the dam was built. The result is that thousands of trout are stranded and die in Lower Fish Creek. Local fly fishing clubs have expressed concerns about this problem. Solving the problem would create a blue-ribbon trout fishery.

Recommendation - A management plan should be set up to provide instream flows in Lower Fish Creek.

14.11.3 Winter Fish Kills

Issue - Some irrigation storage reservoirs are frequently dewatered, resulting in winter fish kills and lost or reduced recreational opportunities.

Discussion - Various lakes such as Miller Flat, Huntington North, Mill Meadow, Johnson Valley, Left Hand, Forsyth, and Wide Hollow reservoirs might allow water to be purchased for conservation purposes. Size of conservation pools could be increased at other waters, including Scofield and Huntington reservoirs. On all of these waters, one must realize that the primary purpose of these facilities is for irrigation.

Recommendation - Conservation pools should be purchased if opportunities allow.

14.11.4 Exotic (Non-native) Fish Species

Issue - Introduced exotic fish species can negatively impact populations of native fishes.

Discussion - Exotic fish often out-compete native species for food, cover, and space and prey on their eggs and young. This may reduce populations of native species such as Colorado River cutthroat trout, bluehead sucker, flannelmouth sucker and roundtail chub. Some exotic trout species readily hybridize with native trout, thereby reducing their genetic purity.

Recommendation - Fish eradication and subsequent restocking projects should be conducted, fish migration barriers constructed, and the public educated about the impacts of illegal/inadvertent introductions of undesirable fish species.

14.11.5 Whirling Disease

Issue - Whirling disease problems are expanding in Utah. If it enters the West Colorado River Basin, it may seriously jeopardize wild trout fisheries.

Discussion - Several private fishing ponds are located in the basin. Whirling disease could be introduced into the basin if stocking of fish from unauthorized sources occurs, although the exact cause has not been determined. McGath Lake on Boulder Mountain in Garfield County may already be infected. Whirling disease causes mortality in young trout and is a significant threat to wild, reproducing trout populations. Many streams and lakes in the basin are managed as wild trout fisheries, including some streams containing native Colorado River cutthroat trout.

Permits should not be approved for ponds on natural stream channels or in other cases where wild and stocked fish could mix. Pond owners should be encouraged to obtain UDWR inspections and the proper permits before stocking. The public should be educated regarding what they can do to prevent entry of the disease into the basin.

Recommendation - Private pond owners should follow established UDWR policies on pond stocking.

14.11.6 Tourism Impacts

Issue - The increasing human population and tourism are creating a larger demand for recreational facilities and activities and can impact resources.

Discussion - The West Colorado River Basin contains several national and state parks, Glen Canyon National Recreation Area and Lake Powell, three national forests, and large expanses of proposed wilderness. The basin is truly a destination recreational area. Tourism in the region has increased and will continue to do so along with a growing population. There will be increasing pressure on fish populations and demand for associated facilities. Increasing numbers of visitors and residents, and continued development, may destroy or disturb progressively areas of fish and wildlife habitat and reduce wildlife populations.

Planning should minimize environmental impacts, and improve recreational facilities and access management. Fish and wildlife regulations should be improved, and aquatic and terrestrial habitats should be created and restored where possible.

Recommendation - Coordination should occur between all interested groups to plan for future growth. The UDWR must become interested in financially participating in projects that provide benefits to fish and wildlife resources. ●